

APPARATUS OF REPAIRING MEMORY CELL AND METHOD THEREFOR

This application is a divisional of U.S. Patent Application No. 09/887,974, filed on *U.S. Patent No. 6,693,831* June 21, 2001, now pending, which is herein incorporated by reference in its entirety.

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BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

The present invention relates to an apparatus and a method of repairing memory cells for converting a higher density memory cell into a lower density memory cell to utilize it, and 10 more particularly to a memory cell repairing apparatus and a method of repairing failed memory cells in case that a rule in failure is detected even though various types of failures are generated.

DESCRIPTION OF THE PRIOR ART

15 As integration density in semiconductor memory devices increases, the size of individual cells decreases. In contrast, a cell fabricating process becomes complex in order to obtain the corresponding capacitance irrespective of the smaller size, thus failure rate in cells increases. In case that the amount of failure rate exceeds that of the redundancy, a number of chips cannot be repaired. Accordingly, techniques for repairing normal memory cells other 20 than the failed memory cells are required. For example, first, the technique for repairing memory cells in the range limited to single bit fail, word line fail, and column fail. Second, the technique for repairing memory cells by converting a high integrated circuit to a low integrated circuit.

In the second technique, for example, a 16M-memory device is converted to an 8M 25 memory device, or a 8M memory device is converted to a 4M memory device. The conventional technique such as the second technique is used to repair memory cells selected from the entire memory cells by bonding residual address signals to the ground or power voltage when the failed memory chip is converted to a low integrated device. The second conventional memory cell repairing technique is disclosed in the Korean Patent Application 30 No. 1996-47789 entitled "MEANS FOR REPAIRING PARTIAL BLOCK OF MEMORY CELL AND METHOD OF REPAIRING THE PARTIAL BLOCK USING SAME" filed October 23, 1996 in the name of Samsung Electronics Co., Ltd. (hereinafter, referred to by reference 1), the Korean Patent Application No. 1999-51337 entitled "SEMICONDUCTOR MEMORY APPARATUS AND METHOD OF REPAIRING THE APPARATUS" filed